40p

Printout No 10

Fortnightly October 27—November 9 1983

# LOAD RUNNER

THE GALAXY'S FIRST COMPUTER COMIC

IMAGINE YOU WAKE UP AND *CAN'T REMEMBER* WHO YOU ARE. IMAGINE THAT THE UNFAMILIAR WORLD AROUND YOU IS A SERIES OF *DEADLY COMPUTER GAMES* YOU CAN'T CONTROL.

*MOVE IT*, PETRA! THAT'S GOING UP WITH A *BANG!*

YOU COULD BE THE *LOAD RUNNER*...

AND YOU'D BE *RUNNING* FOR YOUR *LIFE*.

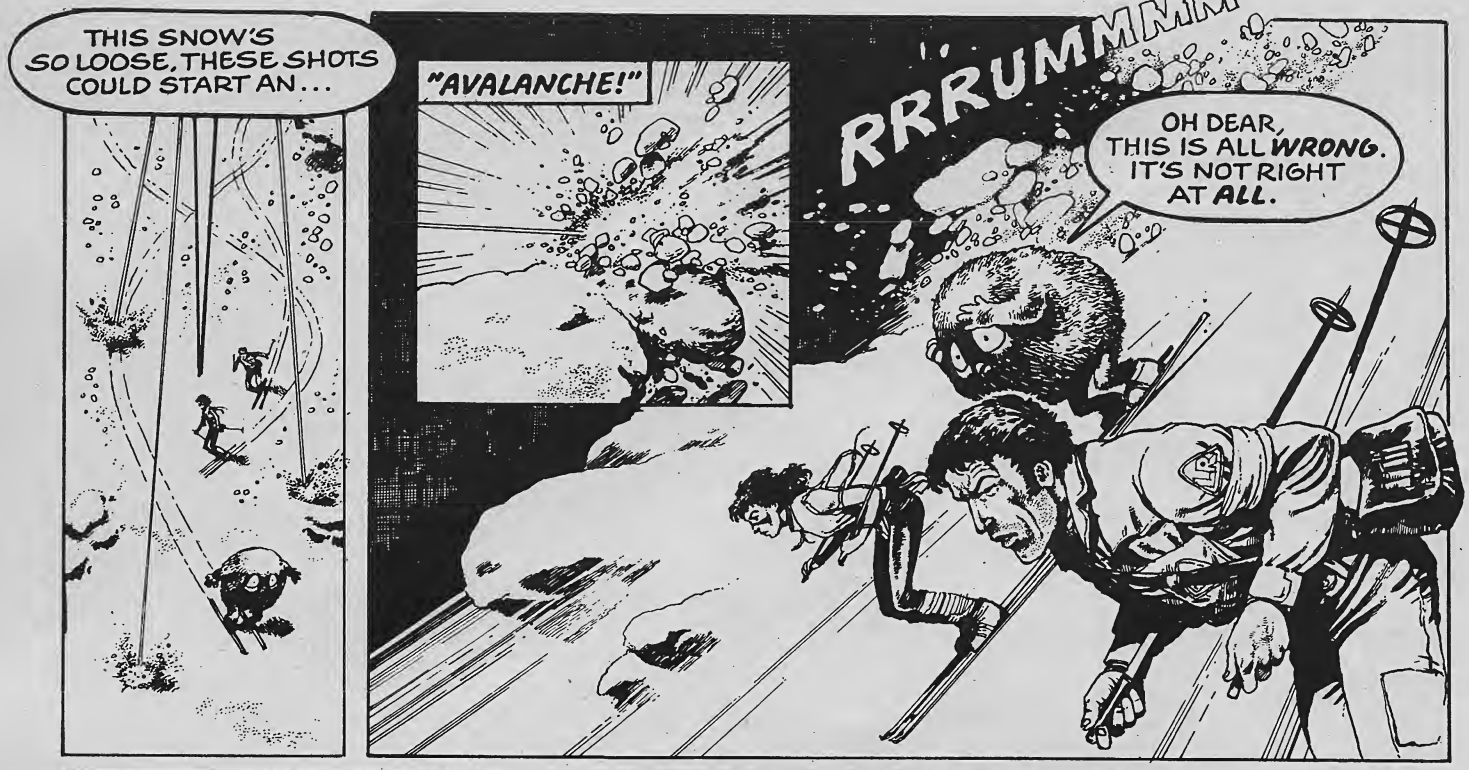
## DEFEAT FOR TRUMBULL

## COMPUTER SUPERSTAR

## ANDY MEETS HIS MATCH

ELSEWHERE, THE COMPUTER IS PROCESSING NEW DATA...
TRACE
=INVALID VARIABLE HAS CAUSED PROGRAM TO CRASH. VARIABLE TRACED AS UNKNOWN HUMAN FEMALE.
=SHE MUST BE LOCATED AND DEFINED... OR DELETED: EXECUTE SECURITY ROUTINE.
IN RESPONSE TO THE COMPUTER'S COMMAND, THE SECURITY ROBOTS MOBILISE...
I DON'T REMEMBER. ALL I KNOW IS THE CRAZY THINGS THAT HAVE HAPPENED TO ME SINCE I WOKE UP IN THAT CITY.
WHAT?! YOU MEAN... THERE HAVE BEEN OTHERS? WHAT HAPPENED TO THEM? WHO'S CONTROLLING ALL THIS?
THANKS, WHOEVER YOU ARE. YOU CERTAINLY SAVED OUR LIVES BACK THERE.
I'M PETRA AND HE'S... LOAD RUNNER... IS THAT YOUR REAL NAME?
UM, WELL NONE OF THEM DOES ACTUALLY. NONE OF THE LOAD RUNNERS I'VE SEEN, ANYWAY.
OH DEAR ME, ALL THESE QUESTIONS. I DON'T KNOW HOW MANY OTHERS, ...BUT NONE OF THEM MADE IT TO SAFETY. I TRIED MY BEST TO HELP THEM.
I'M SORRY, THAT'S ALL I KNOW. SOON THE PROCESSOR WILL DRAW ME BACK INTO MEMORY.
THE SECURITY ROBOTS, NEARBY, RELAY THE DATA TO THE COMPUTER...
MEMORY... THE PROCESSOR! THIS BEGINS TO MAKE SOME CRAZY SORT OF SENSE...
LET'S GET GOING, I'M COLD... HEY, IT'S SNOWING!

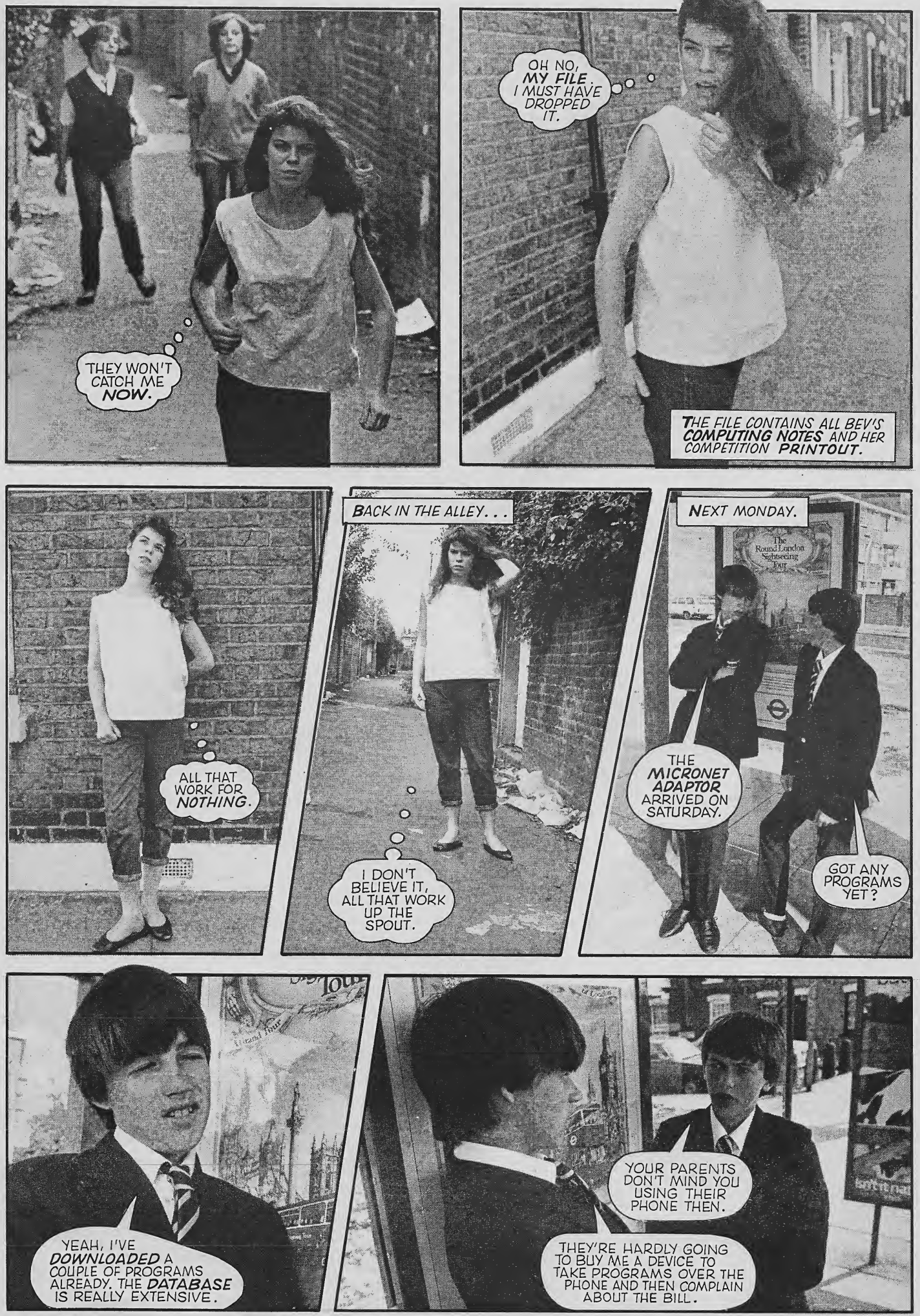
ATTENTION. DO NOT MOVE.
THE ROBOTS AGAIN!
OH DEAR, OH DEAR!
THERE'S A DROP TO OUR LEFT. WHEN I GIVE THE WORD...
GO!!
STOP! OR YOU WILL BE ERASED!
QUICK! THERE'S A CABIN WE CAN SHELTER IN!
THEY'RE FOLLOWING OUR TRACKS.
WHAT'S THIS OVER HERE?
FAN-TASTIC! SKIS! WE CAN GET AWAY FAST WITH THESE.
MIND THE SLOPE. THIS INCLINE IS QUITE TREACHEROUS!


THIS SNOW'S SO LOOSE, THESE SHOTS COULD START AN...
"AVALANCHE!"
RRRUMMMM
OH DEAR, THIS IS ALL WRONG. IT'S NOT RIGHT AT ALL.

AND THEN IT IS TOO LATE! TOO LATE.
UHH! HOW MUCH OF THIS... CAN WE TAKE... BEFORE IT KILLS US?
DON'T WORRY... UHH!... IF THIS DOESN'T KILL US...

...SOMETHING ELSE WILL!
SCRIPT
STEVE CRADDOCK
ARTWORK
PETER DENNIS
LETTERS
MICK HOLLINGWORTH
NEXT PRINTOUT: - BANG, YOU'RE DEAD!

SCHOOL FOR SOFTWARE
IN ORDER TO ENTER THE SCHOOL SOFTWARE COMPETITION BEV JEAVONS USES A DEMONSTRATION MODEL IN THE LOCAL MICRO SHOP. ON THE WAY HOME SHE MEETS TWO GIRLS WHO WANT TO MAKE USE OF HER EXPERTISE.
I SAID, HAVE YOU WRITTEN THAT PROGRAM FOR US?
I HEARD YOU.
WHAT'S THE ANSWER THEN?
SAME AS IT WAS BEFORE.
WE MIGHT CHANGE YOUR MIND FOR YOU.
I DOUBT IT, SPOTTY!
YOU'LL PAY FOR THAT.
GRAB HER ARMS!
SCRIPT – FRANK HOPKINSON
PHOTOS – HENRY ARDEN
LETTERS – JACK POTTER


THEY WON'T CATCH ME NOW.
OH NO, MY FILE. I MUST HAVE DROPPED IT.
THE FILE CONTAINS ALL BEV'S COMPUTING NOTES AND HER COMPETITION PRINTOUT.
ALL THAT WORK FOR NOTHING.
BACK IN THE ALLEY...
I DON'T BELIEVE IT, ALL THAT WORK UP THE SPOUT.
NEXT MONDAY.
The Round London Sightseeing Tour
THE MICRONET ADAPTOR ARRIVED ON SATURDAY.
GOT ANY PROGRAMS YET?
YEAH, I'VE DOWNLOADED A COUPLE OF PROGRAMS ALREADY. THE DATABASE IS REALLY EXTENSIVE.
YOUR PARENTS DON'T MIND YOU USING THEIR PHONE THEN.
THEY'RE HARDLY GOING TO BUY ME A DEVICE TO TAKE PROGRAMS OVER THE PHONE AND THEN COMPLAIN ABOUT THE BILL.

I'M GOING TO LEAVE IT UNTIL THE LAST MINUTE, WHEN THE COMPETITION'S ABOUT TO CLOSE, AND THEN PINCH THE BEST PROGRAM FROM THE FILES.
AND WRITE OUT THE CREDITS.
THAT'LL BE THE TRICKY BIT.
IT WAS HER, YOU KNOW. THAT MUST BE THE FIRST TIME IN TWO MONTHS SHE'S COME PAST AND NOT STOPPED.
WHAT DID YOU SAY TO HER ON SATURDAY?
I TOLD HER TO GET LOST AND LET SOME-ONE ELSE USE THE COMPUTER.
MICRO SHOP
SHE'S ABOUT THE ONLY CUSTOMER WHO'S GOT OBVIOUS TALENT.
YOU MEAN SHE'S THE ONLY CUSTOMER WHO NEVER BUYS ANYTHING.
HOW ARE YOU GETTING ON WITH YOUR COMPETITION PROGRAM, BEV?
I'M NOT. I WROTE ONE AND IT CRASHED, I WROTE ANOTHER AND LOST IT.
DICKERSON WON'T LET ME USE THE SCHOOL COMPUTER, EITHER. TYPICAL, ISN'T IT?
I STARTED WRITING ONE... BUT IT WASN'T VERY GOOD.

THAT'S THE TROUBLE. THEY EXPECT YOU TO WRITE SOFTWARE THAT'S GOOD ENOUGH TO SELL AND THEN GIVE YOU ONLY FIVE MINUTES ON THE COMPUTER.
NEIL STANBURY WAS BRAGGING HOW HE'LL WIPE THE FLOOR WITH EVERYONE.
HE'S GOT HIS OWN COMPUTER, THOUGH. WHATEVER HE WANTS, MUMMY BUYS FOR HIM.
FROM THE ERRORS I'VE SEEN HIM MAKE, MUMMY'S PROBABLY BETTER AT COMPUTING.
HE JUST BUYS GAMES PROGRAMS. HE DOESN'T KNOW THE FIRST THING ABOUT MACHINE CODE.
BEV...
I THINK YOU'RE GOING TO CHANGE YOUR MIND ABOUT WRITING A PROGRAM FOR US.
WHY'S THAT?
LOOK WHAT WE'VE FOUND.
THAT'S MY COMPUTING FILE!
YES, AND IT'D BE A PITY IF IT FELL INTO THE INCINERATOR— WOULDN'T IT.
TO BE CONTINUED.

# INTRODUCING 16/48. THE NEW MONTHLY COMPUTER MAGAZINE WE'VE GOT TAPED.

Forget about listings, copy typing, crashed programs and misprints. Move into a new era with the machine readable monthly.

Every month you get News, Reviews, Games and Educational programs. Month by month you can build a library of useful machine code routines to give your software that professional finish.

There are help features for programmers and for adventurers and every month great prizes to be won in our exciting competition.

## WIN A DIGITAL TRACER OR A LIGHT PEN

With the help of the machine code in our first competition, you will produce high speed animation you never thought possible. Combine a little skill with with lots of imagination and you could be our first winner.

**A FEW OF THIS MONTH'S GREAT FEATURES INCLUDE...**

**Copter** – shoot and then fly!
**Stroke 4** – High speed educational animation
**Soundfx** – a machine code noise library
**Dungeons and Green Men** – expert help for reluctant prisoners and goblin fodder.

**PLUS LOADS MORE TO LOAD**

## ESPECIALLY COMPILED FOR YOUR SINCLAIR ZX SPECTRUM

16/48 will run on 16K and 48K machines. In fact the magazine knows which machine you are using and automatically uses the appropriate addresses.

**THE MONTHLY CASSETTE MAGAZINE FOR THE 16K & 48K ZX SPECTRUM**

Published by Magnetic Magazines Ltd., PO Box 180, Kingston-upon-Thames, KT2 6AL. Surrey

**AVAILABLE IN BRANCHES OF W.H. SMITH, JOHN MENZIES AND OTHER LEADING NEWSAGENTS. LOOK OUT FOR THE LAUNCH ISSUE ON 13th OCTOBER**

# Load Runner T-shirts for lucky Decoders

ONCE AGAIN three exclusive *Load Runner* T-shirts are waiting to be claimed by the Decoders whose membership numbers are listed in the coded printout below. To discover whether you are one of the lucky ones, decode the message using your Cipher Book. The message also contains an easy question. If your number is included, claim your prize by writing your name, address and membership number on a postcard, together with the answer to the question, and post it to me at my installation base, to arrive not later than November 11. Don't forget to state whether you require a small, medium or large size T-shirt. The prize-winners will have their photographs displayed on this page in future printouts.

LOAD RUNNER
THE GALAXY'S FIRST COMPUTER COMIC

DECODERS

SBN GTRFX VDIINPQ APN:
JIN SBPNN ZNPJ IDIN.
JIN JIN IDIN ZNPJ.
JIN ZNPJ ZNPJ QDW.
VBJ DQ SBN BNPJDIN JY QRBJJG YJP QJYSVAPN?

*(Keyword No. 5)*

## Join the Club

*THE LOAD RUNNER DECODERS is a rapidly-growing fan club for readers of the first computer comic in the galaxy. A new member will receive a personalised security pass with his or her photograph mounted on it, together with a membership number. This Security Pass will give the bearer a reduced admission charge to exhibitions and computer fairs announced from time to time in the Decoders page of* Load Runner.

*Each member will also receive the Decoders Cipher Book which provides the key to the coded messages which appear in each printout. Exciting prizes are awarded to successful Decoders whose membership numbers appear in those messages.*

*The cost of membership is £3. If, however, you cut out the word Decoders from the top of this page and from one other printout of* Load Runner, *you can join the club at the special reduced rate of £1. Simply fill in the application form below and send it together with your membership fee and TWO passport-size photographs to: The Controller, Load Runner Decoders, ECC Publications, 196-200 Balls Pond Road, London N1 4AQ. Please make cheques or postal orders payable to ECC Publications Ltd.*

List below the story/programs and fact routines you like best in Load Runner.

1 .....

2 .....

3 .....

What do you dislike most in Load Runner?

.....

Do you have a computer? YES/NO

Name ..... .....Age .....

Address .....

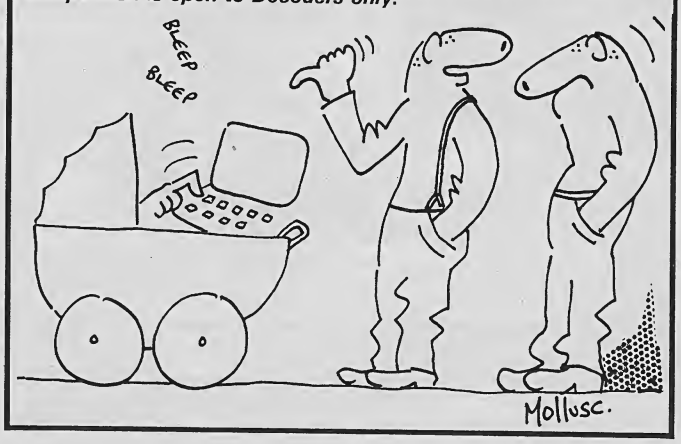
.....

## Star Letter

**ARE YOU a Decoder with a difference? Do you have an interesting hobby or an unusual use for your computer? Has something out-of-the-ordinary ever happened to you? Write and tell me about it, including a photograph if possible. £5 will be paid for each Star Letter published.**

## Caption Competition

*CAN YOU think of a funny caption for the joke which the artist has drawn below? If you can, write it on a postcard together with your name, address and membership number, and send it to: Decoder Joke, Load Runner, EEC Publications, 196-200 Balls Pond Road, London N1 4AQ. £5 will be paid for each entry published. This competition is open to Decoders only.*



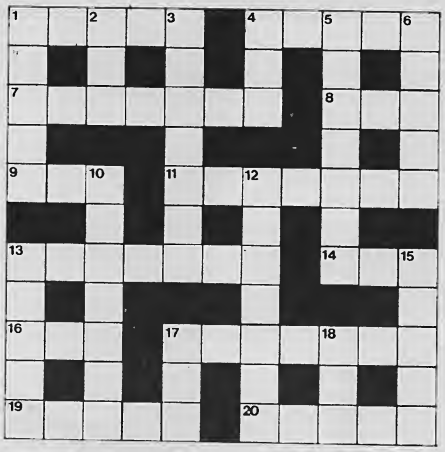
THE GRID BELOW contains five words which can be traced horizontally, vertically and diagonally. Find the correct starting letter for each word and trace that word to its end. The words all describe types of computer program and start with the letters printed in bold type.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| S | S | I | G | N | A | L | M |
| E | **B** | N | T | E | **E** | D | U |
| N | U | E | B | U | R | C | A |
| I | S | V | D | I | S | I | T |
| N | O | I | D | M | E | O | N |
| N | A | T | **A** | U | I | T | **U** |
| E | C | A | L | A | L | I | T |
| B | E | L | L | F | O | X | Y |

THE LETTERS BELOW form words when in the correct order. They are on vertical strips which can be moved up and down. When a strip is moved up each letter moves up and the top one goes to the bottom row. When moved down the bottom letter moves to the top of the column. See if you can juggle the columns into the correct order to form five microcomputer terms.

| | | | | |
|---|---|---|---|---|
| M | A | Y | A | |
| D | R | B | | |
| K | I | I | L | E |
| C | A | C | V | E |
| D | E | T | R | O |

# Wordplotter 10



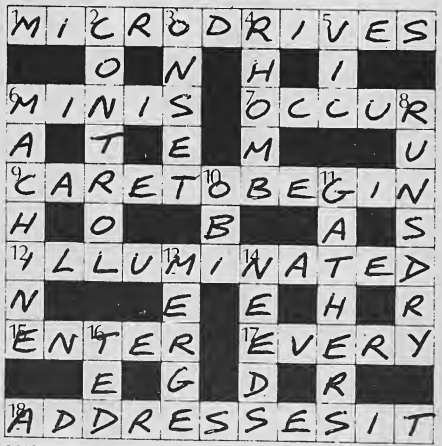
**Across**

1. George started computer algebra (5)
4. Computer for the teacher (5)
7. How processors carry out capital programs (7)
8. Essential lubricant for English programmers? (3)
9. Christopher and his DIY micro (3)
11. Make progress and cave collapsed (7)
13. Commercial folk, mostly computerised now (7)
14. Group in TRS-80 pixel-lighting instruction (3)
16. Foreground colour with Spectrum and Oric (3)
17. Not an add-on (5-2)
19. Muslim magistrates (5)
20. How the programmer treats his program until finished (5)

**Down**

1. Press it when you want some 8? (5)
2. Binary's highest number (3)
3. What parents hope micros will do (7)
4. Copy 4 across without programming language (3)
5. Equipment safeguards (7)
6. Wipe out and age the home counties (5)
10. Followed the spoor on the cassette? (7)
12. Remains of underclothing I put on germanium (7)
13. IBM motto (5)
15. Output from micro speakers (5)
17. Public transport line for data (3)
18. Thou French person! (3)

***WORDPLOTTER 9 SOLUTION***




***ANSWERS to the puzzles in last printout:***

***The four computers concealed in the wordsquare are: DRAGON, NEWBRAIN, SPECTRUM and PET.***

***The mixed-up buzzword phrases are: LOAD RUNNER, BRAINSTORM, DISC DRIVE, MACHINE CODE, HIGH RESOLUTION.***


# Chilling TALES from the MEMORY BANKS

***A NEW SERIES of spine-tingling story-programs is LOADed and ready to RUN in Printout No. 11 — stories about computers past, present and future, and each with a sting in the tail! Don't miss the first mysterious Tale from the Memory Banks — order your copy NOW.***

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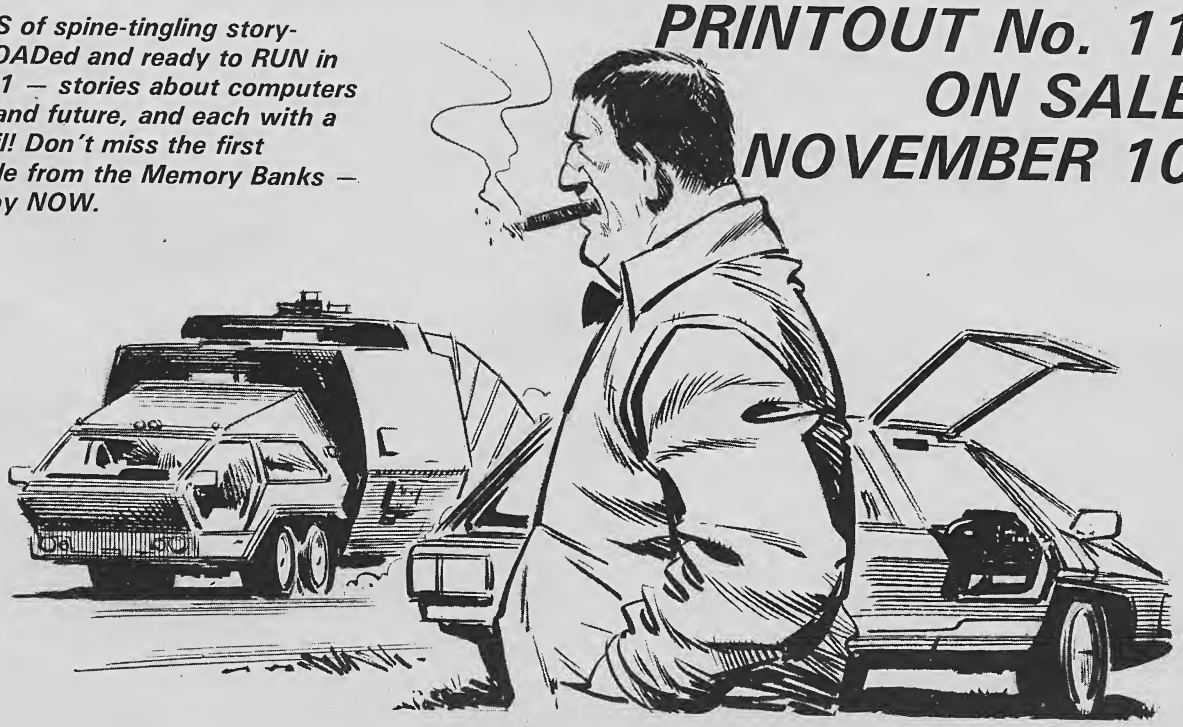

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# ALLA

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(£14.95 each incl. VAT and P&P).

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Card No.....

Please print name and address

Name.....

Address.....

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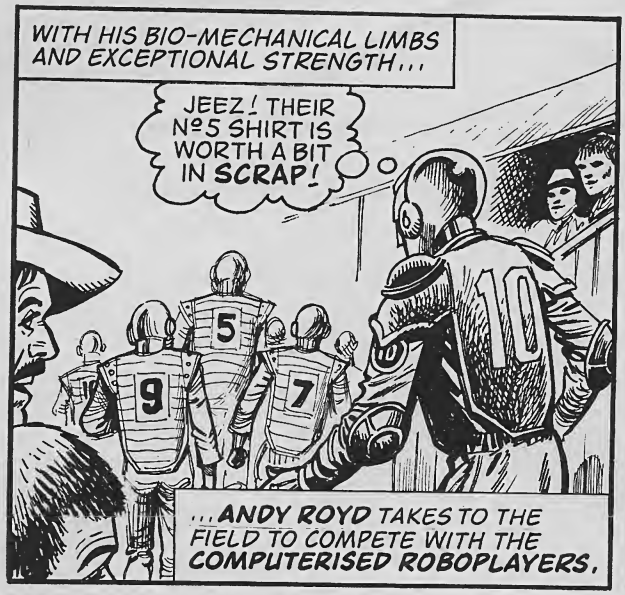
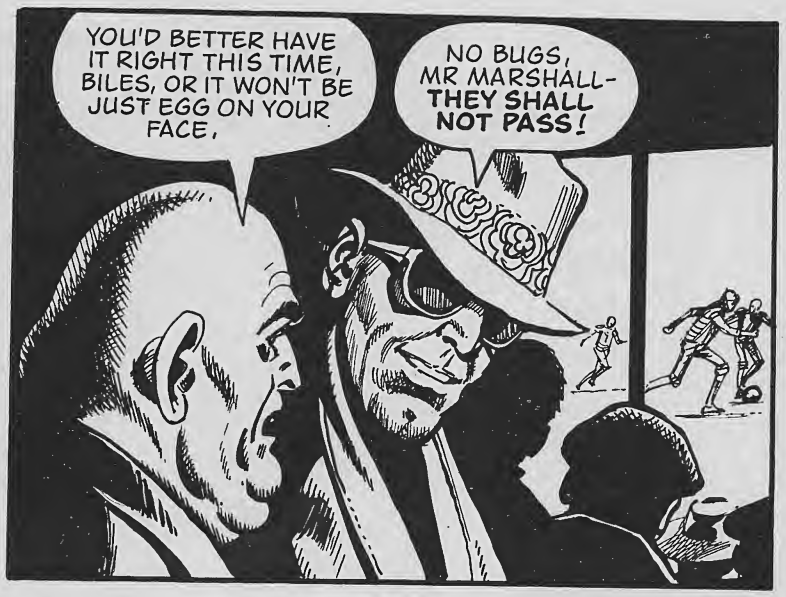
# Andy Royd–the DOMINATORS' Rogue star!

ROYD SPEAK BACK.
WHERE THE HELL HAVE YOU BEEN?
NEVER MIND THAT - JUST LISTEN.
ANDY REPORTS WHAT HE'S SEEN...
...BUT I'VE NEVER SEEN THIS GUY IN THE WHITE HAT BEFORE.
HYP
OH, I THINK I HAVE! HIS NAME'S ROLAND BILES. HE'S A PROGRAMMER, VERY GOOD, BUT VERY BENT.
ELSEWHERE, BILES IS WORKING FEVERISHLY...
THIS PROGRAM IS DAMN NEAR PERFECT - BUT I'VE AN IDEA HOW TO GIVE IT A LITTLE EXTRA HELP!
THIS ALUMINIUM ALI IS GOING TO HIT THE DOMS RIGHT WHERE IT HURTS!
BILES HAS BEEN KICKED OUT OF NEARLY EVERY SOFTWARE HOUSE IN THE COUNTRY - MAINLY FOR COMPUTER FRAUD. HE NEVER GETS PROSECUTED BECAUSE NO-ONE WANTS THE PUBLICITY.
AND NOW HE WORKS FOR MARSHALL. NEXT SATURDAY'S MATCH WITH THE MACHINE HEADS IS GOING TO BE VERY INTERESTING.


WITH HIS BIO-MECHANICAL LIMBS AND EXCEPTIONAL STRENGTH...
JEEZ! THEIR Nº5 SHIRT IS WORTH A BIT IN SCRAP!
...ANDY ROYD TAKES TO THE FIELD TO COMPETE WITH THE COMPUTERISED ROBOPLAYERS.


YOU'D BETTER HAVE IT RIGHT THIS TIME, BILES, OR IT WON'T BE JUST EGG ON YOUR FACE.
NO BUGS, MR MARSHALL- THEY SHALL NOT PASS!

THE GAME STARTS...
THEY'RE RUNNING A REALLY WEIRD PROGRAM - I JUST CAN'T SUSS IT.

I CAN'T SHAKE THIS ROBO OFF!
AND IT'S BEGINNING TO HURT!

OOOF!
ANDY TAKES ALL THE PUNISHMENT HE CAN, UNTIL...

DAVY GET ME OFF!
WHAT HAS HAPPENED TO ANDY? FIND OUT NEXT PRINTOUT!

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# The Second Sinclair User Annual

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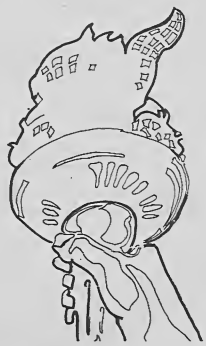

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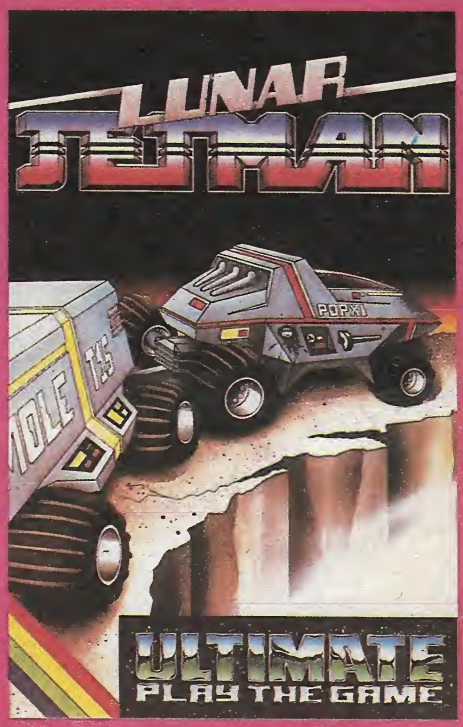
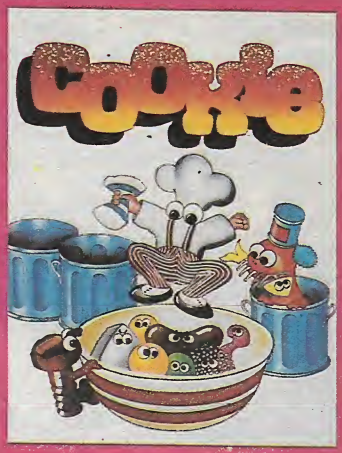
## LUNAR JETMAN – 48K ZX Spectrum

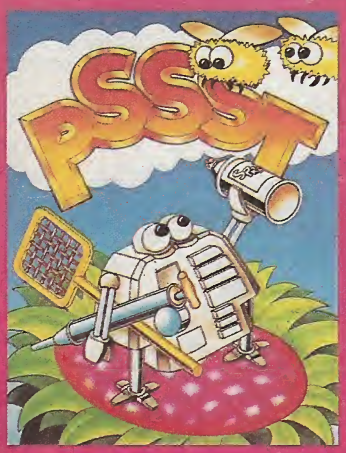
**LUNAR JETMAN** – For the **48K Sinclair ZX Spectrum**
**LUNAR JETMAN** – The Ultimate Intergalactic **G.A.S. (Graphic Arcade Simulation)** Adventure Space Battle.
**LUNAR JETMAN** – Arcade standard, 100% machine code, incredible sound effects, amazing smooth high resolution graphics, the totally new addictive concept and all those extra features you expect from the **ULTIMATE** games people.
Design – The **ULTIMATE PLAY THE GAME** design team.

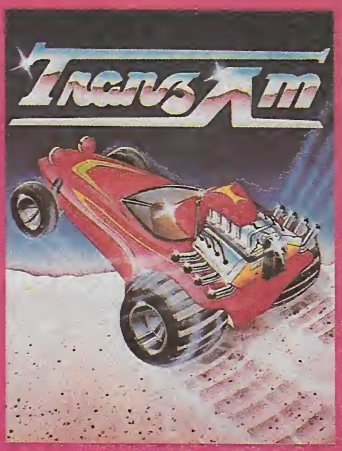



## COOKIE – 16/48K ZX Spectrum




## PSSST – 19/48K ZX Spectrum






## TRANZ AM – 16/48K ZX Spectrum

**ATIC ATAC** – For the **48K Sinclair ZX Spectrum**
**ATIC ATAC** – The super spooky 3D horror **G.A.S. (Graphic Arcade Simulation)** Adventure Game.
**ATIC ATAC** – Arcade standard, 100% machine code, incredible sound effects, amazing smooth high resolution graphics, the totally new addictive concept and all those extra features you expect from the **ULTIMATE** games people.
Design – The **ULTIMATE PLAY THE GAME** design team.

## JET PAC – 16/48K ZX Spectrum or 8K Expanded VIC 20

## ATIC ATAC – 48K ZX Spectrum

**Dealer enquiries welcome. Phone (0530) 411485**

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**£5.50 each including VAT, first class postage and packing within UK.**

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- ☐ ATIC ATAC
- ☐ JET PAC
- ☐ COOKIE
- ☐ TRANZ AM
- ☐ PSSST
- ☐ JET PAC (8K Expanded VIC 20)

I enclose cheque/PO for £.....
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Address.....
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.....
Post Code.....

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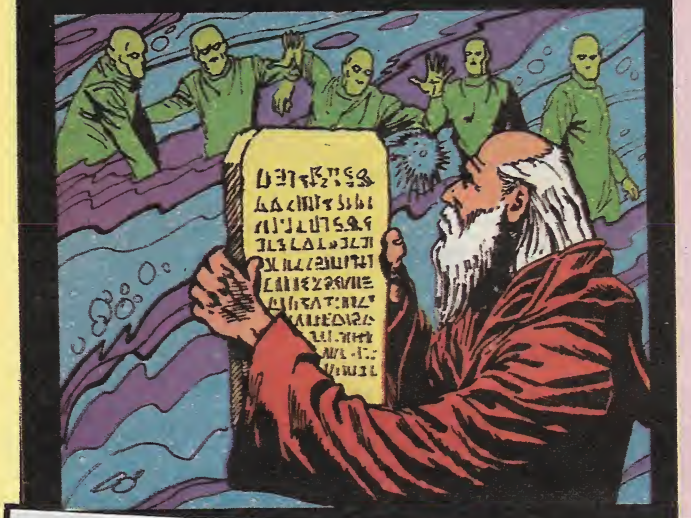
The Green, Ashby de la Zouch, Leics. LE6 5JU

ACORNSOFT GAMES

# Philosopher's Quest

for the BBC Microcomputer Model B



# Cryptic quest

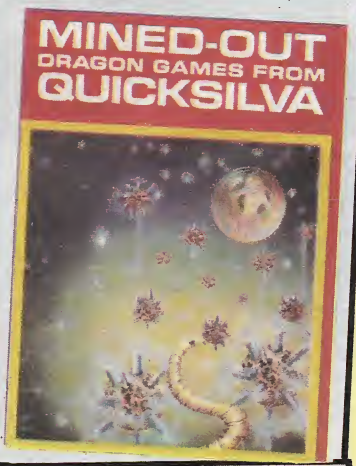
*FINDING A TREASURE and bringing it back to where you started is your mission in Philosopher's Quest — and it will probably take some time before you succeed. You start in a small shop, from which you can take various objects to help you on your way — including an aqualung, which sounds as if it might be useful. Outside it is pitch dark and a giant spider threatens to pounce before you get very much further.*

*In the best traditions of adventure games, you have to guess the answers the computer wants to hear before it allows you to proceed — it will say "eh?" whenever it does not understand. There is a well-presented little booklet in which the chief philosopher gives various cryptic hints to help you and although you will not find any graphics, the game is intriguing enough to keep you playing, without being so difficult that you want to throw up your hands in despair at the very thought of a philosopher.*

*Produced by Acornsoft, Philosopher's Quest runs on the BBC Model B and costs £9.95.*

*Fun, 7; addictive, 8; graphics, 0.*

# Marooned in a minefield




BILL THE WORM, star of stage and screen, is in trouble. He is marooned in the middle of a minefield for some reason and you must rescue him and various assorted damsels in distress.

In Mined Out, for the Dragon 32, you must manoeuvre your player through the minefield, starting at the bottom and moving up to the top. If you move near a mine the Dragon will warn you with a beep and if you land on a mine you will be blown up and Bill will never be rescued.

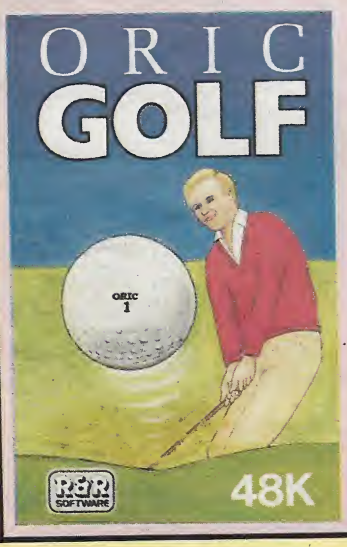
There is a fence round the field and you can move around the top and bottom so long as you stay close to the fence. If you hit the fence you will suffer a fatal dose of electricity.

When the game has finished and you have lost, the computer will display the path which led you to your death. To add salt to the wound it will even show you where you exploded.

Mined Out is good fun and excellent value. The graphics may not be exceptional but the whole game concept makes up for that inadequacy. It can be obtained from Quicksilva and costs £4.95.

Fun, 8; addictive, 9; graphics, 7.

# Tee-off with Oric




*EITHER YOU LOVE or hate the thought of playing golf and it is the same with the new version of Golf for the Oric 48K.*

*One to six players can participate, although it is no fun playing on your own. The rules are the same as for the real game of golf although this is more for fun and not an accurate simulation of the sport of directors.*

*All the usual hazards are to be found on the course. They include water, trees, fairways, bunkers and the rough. You will find that you make a habit of falling into all those traps at least 10 times in a game. There is no way of escaping them, unless you have worked out how to angle your strokes in such a way as to get a hole in one. In many instances your skill will be of no help, as trees will block the tee-off position from the hole at which you are aiming. In that case you should try to hit the ball so that it clears the woods, as there is nothing worse than getting caught inside.*

*The game is a little undramatic for those of you who like Space Invaders or Galaxians but for those who want to relax for a while golf will take your mind off things.*

*Golf costs £7.95 and can be obtained from R and R Software.*

*Fun, 7; addictive, 7; graphics, 8.*

# Terror falls from above

THE TERROR in the sky is the subject of Terror-Daktil for the 48K Spectrum.

You are trapped in a jungle after your aircraft has crashed on to a plateau. It will take several days for the search craft to find you and the monsters which could attack include some giant reptilian birds which swoop from the heat-filled sky. You will be safe during the night but dawn will bring the terror anew.

The manufacturer claims that it uses three-dimensional effects. While the bird sequences are very detailed the 3D effect would be negligible were it not for the grid making up the floor of the valley below.

The introductory sequences are unnecessarily long as they first describe the crash and then show it visually in full animated graphics. If you want a quick entry into the game you will be disappointed. It takes several minutes to reach the main attack sequence with the birds swooping and you are using your antique cannon on them. That sequence lasts, on average, only for about 50 seconds.

If you want a fast action game which lasts for a long time it would be a good idea to give this one a miss.

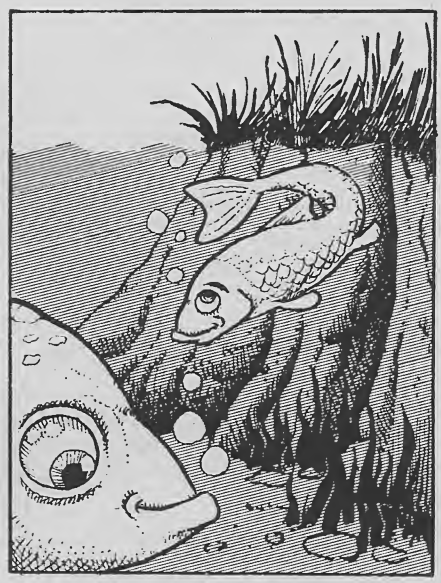
Terror-Daktil can be obtained from Melbourne House and costs £6.95.

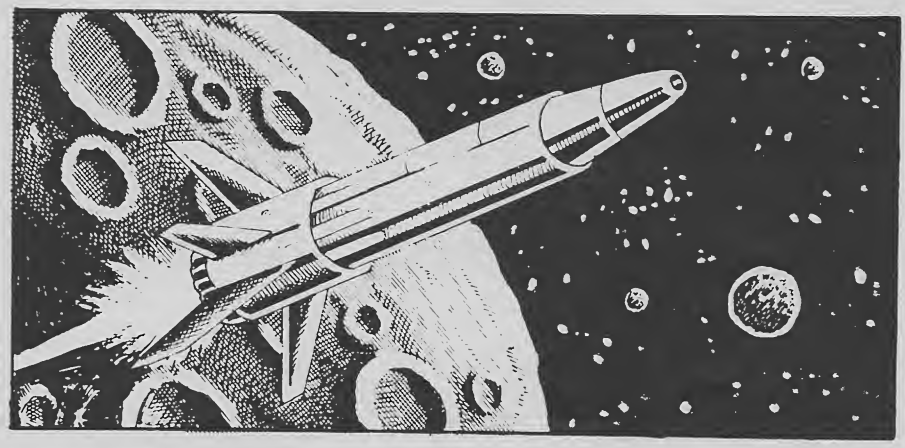
Fun, 5; addictive, 5; graphics, 8.

# Computers clean up

*FISH cannot survive in polluted water as they often become poisoned or die through lack of oxygen. Fish swimming in the River Frome near Bath, now have a much better chance of enjoying a clean home, because of a computer.*

*The Wessex Water Authority is using equipment which can compare a sample of dirty water to the characteristics of 30,000 chemicals stored in the computer memory. The importance to the fish is that the sample can be analysed in a few hours, compared to months using manual methods, and that means the source of the pollution can be traced quickly.*





# Chips in space

ALTHOUGH SPACE has yet to be fully conquered, research by scientists working on space projects helped to revolutionise computing as we know it today. It happened because they realised that if electronic devices were to go into space they had to be altered radically, as they were too big.

Miniaturisation was the answer and so scientists developed the forerunner of today's microchip, which as a bonus proved to be more reliable than the old electrical circuits, as well as less power-hungry. At the time those scientists were probably unaware exactly how crucial the concept was to be to computing. The rest is history.

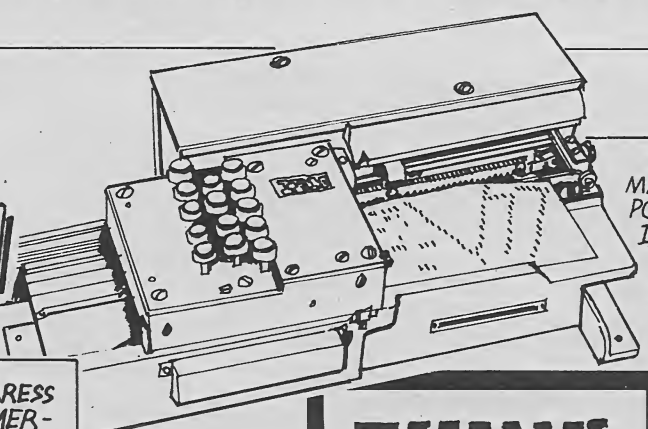
# Self-programming micros?

EVERY PROGRAMMER who cannot track that one elusive bug which is ruining a program must wish for a computer where the user has only to specify what the program has to do and the computer does all the rest of the programming. Computers of that kind might not be so far away if research taking place now is fruitful. Self-programming systems are technically possible to build already — one developed a few years ago could even make mistakes typical of humans and then correct the errors automatically — but they need very large memories and are very slow.

Now, however, a revitalised race is on in the U.S. to develop a commercial self-programming computer which will tackle the problems and industry watchers say if that happens it could mean the end of programming and, more satisfactorily, the end of software errors.

# The Computer Story

## A HISTORY OF COMPUTERS PART TEN



SOCIAL AND TECHNICAL PROGRESS ALONE COULD NOT ENSURE THE EMERGENCE OF COMPUTERS AS WE KNOW THEM TODAY. JUST AS NECESSARY WERE TECHNICAL RESOURCES AND, MOST OF ALL, LOTS AND LOTS OF MONEY.

AS WE SHALL SEE, UNIVERSITIES PROVIDED A LOT OF THE CREATIVE AND INTELLECTUAL EXPERTISE, AND WORLD WAR II WAS THE SPUR FOR GOVERNMENT INVESTMENT IN SPECIAL-PURPOSE COMPUTERS. THE BASIS OF A SUCCESSFUL COMPUTER INDUSTRY, HOWEVER, LAY IN BIG BUSINESS.

## THE WAY-AHEAD

## I THINK

## BUSINESS INTERNATIONAL MACHINES

A COMPANY DESTINED TO BECOME A MAJOR FORCE IN MAKING COMPUTERS POPULAR AFTER WORLD WAR II WAS IBM. IT ALSO BUILT AND PROVIDED THE MONEY FOR AMERICA'S FIRST AUTOMATIC DIGITAL COMPUTER. IN THE EARLY 1930s ALL THIS LAY IN THE FUTURE, BUT UNDER THE PRESIDENCY OF THOMAS J. WATSON, A BUSINESS EMPIRE WAS BEING CREATED THAT BECAME ONE OF THE WORLD'S GREATEST MULTINATIONAL CORPORATIONS, EMPLOYING A QUARTER OF A MILLION PEOPLE.

Top: Tabulating machinery and punched-card machines like the one shown were IBM's main products in the 1930s.
Above: Watson brought with him to IBM the slogan T-H-I-N-K which was printed on cards and hung in every office. Left: The early IBM logo. Far right: Early IBM offic

Written and drawn by Chris Smith

# Slave robots

**Buzzwords are the jargon of the computer world and can be very confusing. Below, *Load Runner* continues its glossary of computing terms. Get buzzing.**

**DID YOU KNOW that the word robot originated from the Czech word robota, which means compulsory labour? The playwright Karel Capek first used the term robota when he described hypothetical androids used for slave labour, who eventually revolted against their masters. That was in 1920 and today scientists use the word robotics when they are studying automatic machines which can be programmed for all kinds of jobs.**

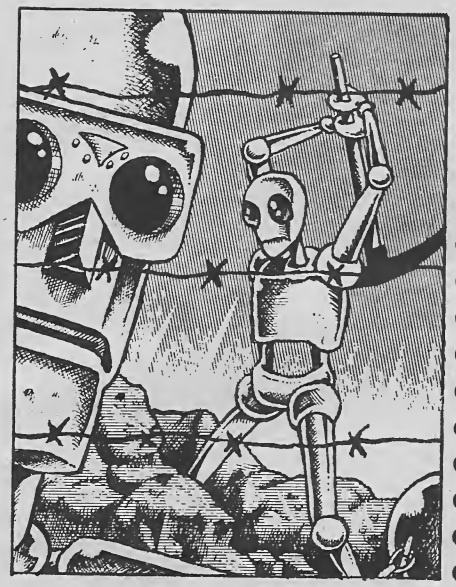


**Image scan.** Any device which handles images, such as pictures, graphics or photographs. Such devices include light pens, graph plotters and optical readers which can read handwriting. An image scan includes any way of putting information about a visible object into a computer.

**Impact printer.** A computer printer which uses a head which has to hit something, i.e., paper, to create an image. The print-head usually hits the inked ribbon, which then hits the paper and puts ink on to it.

**Information.** Anything stored in the computer. Another term is data. It can be in the form of programs or data on which the computer will act, such as a list of names and addresses.

**Input/output (I/O).** The entry and exit of information to and from a computer system. Input can be made using devices such as a keyboard or light pen. Output is provided for a program via a screen or a printer.

**Instruction.** A command or statement which orders the computer to do something. Usually it consists of a command such as PRINT and a piece of data, such as INFORM. That instruction will print out the data INFORM on to a screen.

**Integer.** A whole number, such as 10 or 15, which does not include a decimal portion. It means that there is no decimal point in the number, such as 1.2 or 5.665.

**Integrated circuit.** An electronic chip which controls a computer. It contains many pathways through which electronic currents pass. The pulses perform the work of the computer.

**Intelligence.** Where a computer is concerned it means the act of reasoning in the manner a human would do. Computers are not yet capable of true intelligence, so we term their intelligence as artificial.

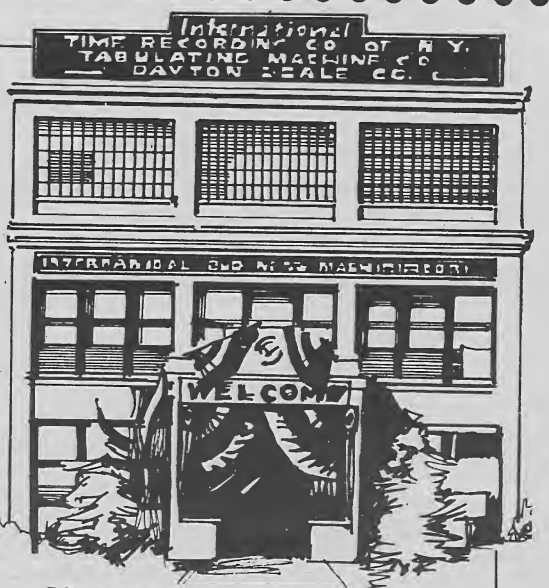
**Interface.** A piece of hardware which will allow another device, such as a printer or another computer, to be attached to the main computer. There are two types. The Centronics interface can be used to attach printers to a computer. The RS232 and its cousin, the RS423, will connect printers and computers to a main computer.

**Interpreter.** The program inside the machine which translates high-level Basic language into machine code, a language the computer can understand.

THOMAS J. WATSON WAS BORN IN NEW YORK IN 1874, WORKED AS A GROCERY BOOKKEEPER, THEN SOLD SEWING-MACHINES AND MUSICAL INSTRUMENTS. IN 1914, AFTER NINE YEARS WITH THE NATIONAL CASH REGISTER CO. (NCR), WHERE HE BECAME GENERAL SALES MANAGER, HE WAS CHOSEN TO HEAD THE COMPUTING-TABULATING-RECORDING COMPANY. THIS HAD BEEN FORMED IN A MERGER OF HERMAN HOLLERITH'S HIGHLY SUCCESSFUL COMPANY WITH THREE SMALLER ONES.

IN TEN YEARS CTR's BUSINESS TRIPLED, AND WATSON RENAMED IT INTERNATIONAL BUSINESS MACHINES (IBM) WITH THE AIM OF CAPTURING WORLD MARKETS.

WATSON BELIEVED IN SALESMANSHIP AS A PROFESSION, AND ALTHOUGH UNPREDICTABLE AND HOT-TEMPERED, WAS AN INSPIRING LEADER. HE MOTIVATED SALESMEN WITH ANNUAL TARGETS, RAN TRAINING SCHOOLS FOR THEM, AND SET UP ENGINEERS' CLASSES WHERE CUSTOMERS LEARNED TO USE THEIR IBM EQUIPMENT MORE EFFECTIVELY. ALTHOUGH HE RESISTED THE FORMATION OF TRADES UNIONS WITHIN IBM, HE ALLOWED WORKERS SHARES INSTEAD OF SALARY, AND SEVERAL




BECAME MILLIONAIRES.

WATSON WAS SOMETHING OF A SHOWMAN - HIS SPEECHES WERE PEPPERED WITH MORALE-BOOSTING SLOGANS, AND HE WAS SOON ABLE TO BOAST, "THE SUN NEVER SETS ON IBM."

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# ROCK FILE

## The Rolling Stones Story—on disc

AT THE RECENT Personal Computer World exhibition two computer freaks met for the first time — 12-year-old Marcus Domleo and rock-and-roll superstar Bill Wyman of the Rolling Stones. Bill was presenting Marcus with £500 worth of software and hardware, first prize in the recent Virgin Games Gang competition.

The owner of two Apple computers and an extensive range of hardware, Bill has been using the new technology to catalogue the entire history of the Rolling Stones, a monumental task which will eventually be published. "It'll probably be my epitaph," he admits with a grin.

*Top: Marcus, left, and Bill Wyman, centre, at the prize-giving.*

*Below: Bill and Marcus test one of the Virgin games.*

# THE INVASION OF THE ARCADIANS

SCRIPT: LES COOKMAN
ART: JOHN STOKES
LETTERS: STEVE POTTER

IN A DESPERATE ATTEMPT TO SABOTAGE THE ALIEN INVASION OF EARTH, D'S GANG HAS TRACED THE MIND WARP ARCADE MACHINES BACK TO THEIR SOURCE...

...ONLY TO WALK STRAIGHT INTO THE HANDS OF THE ENEMY—

OH NO! WHAT HAVE THEY DONE TO YOU?

THEY WERE WAITING FOR US... IN AN ENORMOUS ARCADE ...WE WERE TRAPPED BY THE *MIND WARP* MACHINES...

...AND THEN THEY BROUGHT US HERE... WHERE *ARE* WE? HOW DID *YOU* GET HERE?

WHEN YOU'VE *QUITE* FINISHED YOUR PLEASANTRIES...

...WE CAN PROCEED. YOUR TIRESOME MEDDLING HAS GREATLY DISPLEASED MY MASTERS.

THEY ARE VEXED TO SEE HOW RESILIENT HUMANS CAN BE TO MIND WARP. IT IS FORTUNATE THAT THERE ARE ONLY A FEW WHO HAVE THE POWER TO RESIST—AS IT IS, YOUR INTERFERING HAS BROUGHT THE INVASION FORWARD. IT IS NOW ONLY HOURS AWAY.
HOWEVER, MERE HUMANS LIKE YOU COULD NEVER SUCCEED AGAINST THEIR AWESOME MIGHT WITHOUT HELP. WHERE IS YOUR LEADER?
I HAVEN'T GOT THE FAINTEST IDEA WHAT YOU'RE TALKING ABOUT. ALL I DID WAS PLAY THE MACHINES FOR A DARE.
AND ME MUM'LL KILL ME IF I'M LATE FOR SUPPER. I BET SHE'S ALREADY GOT THE COPS LOOKING FOR ME!
SHUT IT! THERE'S NO TIME FOR THESE STUPIDITIES. I'LL ASK YOU ONCE MORE. WHERE IS YOUR LEADER? IF YOU DON'T TELL ME...
MEANWHILE, THEIR LEADER D IS LOST...
I MUST FOCUS MY MIND TO DISCOVER WHERE THEY ARE...
D'S MIND GRASPS AND HOLDS AN IMAGE OF THE BUILDING WHERE HIS FRIENDS ARE HELD.
BUT HE IS BEGINNING TO WEAKEN...
THERE'S NO OTHER WAY... I'LL HAVE TO TAP MY CEREBRO-MOTIVE FORCE ONCE MORE ...BUT THE POWER IS DRAINING FAST!

AT LAST THE FORCE BEGINS TO FUNCTION.
MADE IT— ONLY HOPE I'M IN TIME...
D MATERIALISES IN THE CONTROL CENTRE...
SEIZE HIM!
SO WEAK... CAN'T RESIST...
I MUST WARN YOU—I AM FROM THE FEDERATION OF GALACTIC INVESTIGATORS!!
AND YOU ARE ALL UNDER ARREST!!
OH, YES? AND WHO WILL PUT US UNDER LOCK AND KEY? YOU, MR. FED-TEC? OH, NO! YOU CANNOT WIN NOW—BUT— TO ADD A LITTLE AMUSEMENT TO YOUR FINAL HOURS, YOU CAN PLAY MY MASTERS...
...AT THEIR ULTIMATE GAME! THEY DESERVE A LITTLE DIVERSION BEFORE THEY FINALLY INVADE THIS PLANET WHICH THEY HAVE WORKED SO HARD TO PREPARE. THEY ARE WAITING JUST OUTSIDE THE EARTH'S ATMOSPHERE, AND THEY HAVE PREPARED A GIGANTIC MIND WARP FOR YOU ALONE...
AND FOR ONCE STAR-FUZZ YOUR FRIENDS ARE POWER-LESS TO HELP YOU!
CONTINUED NEXT PRINTOUT...

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# Jupiter Ace

**Jupiter Cantab,**
**22 Foxhollow,**
**Bar Hill,**
**Cambridge CB3 8EP**

| **Specifications** | |
|---|---|
| Price | £89.95 |
| Number sold | 70,000+ |
| How sold | Assembled |
| Processor | Z-80A |
| Standard RAM | 3K |
| Expansion RAM | 16K |
| Basic + operating system | Forth language 8K |
| Display | Black and white 24 lines × 32 characters |
| Tape recorder | Any |
| Backing storage | — |

**Software**
Jupiter Cantab, 22 Fox Hollow, Bar Hill, Cambridge CB3 8EP.
Remsoft, 18 George Street, Brighton BN2 1RH.

**Comments**
The Ace is very poorly supported with software. That is not surprising as it uses the Forth language and not Basic. Most people regard Forth as difficult to program and it is closer to assembly language or machine code than Basic. It is also about 10 times as fast as Basic and because of that a Forth programmer should not have to resort to machine code to write software such as quick-action arcade games.

**Program**
The program below is useful when programming the Jupiter Ace. The program lists the current status of the first eleven values on the stack. The program also helps to demonstrate how the stack manipulation instructions such as DUP, DROP, SWAP, PICK and ROLL work.

```
: LP
  12 1
  DO
   I PICK . CR CR
  LOOP
;

: ST
  INVIS CLS 4 3 AT
  ." STACK TOP"
  SPACE LP VIS
;
```

# LIFEBOAT

**PICK UP survivors and first aid boxes from the sea, while avoiding wreckage and sharks. Score one point for each survivor rescued, and a bonus of 50 for each score completed. Collecting a box adds 500 points to your box counter. If the counter falls to 100 you will lose one of your three lives.**

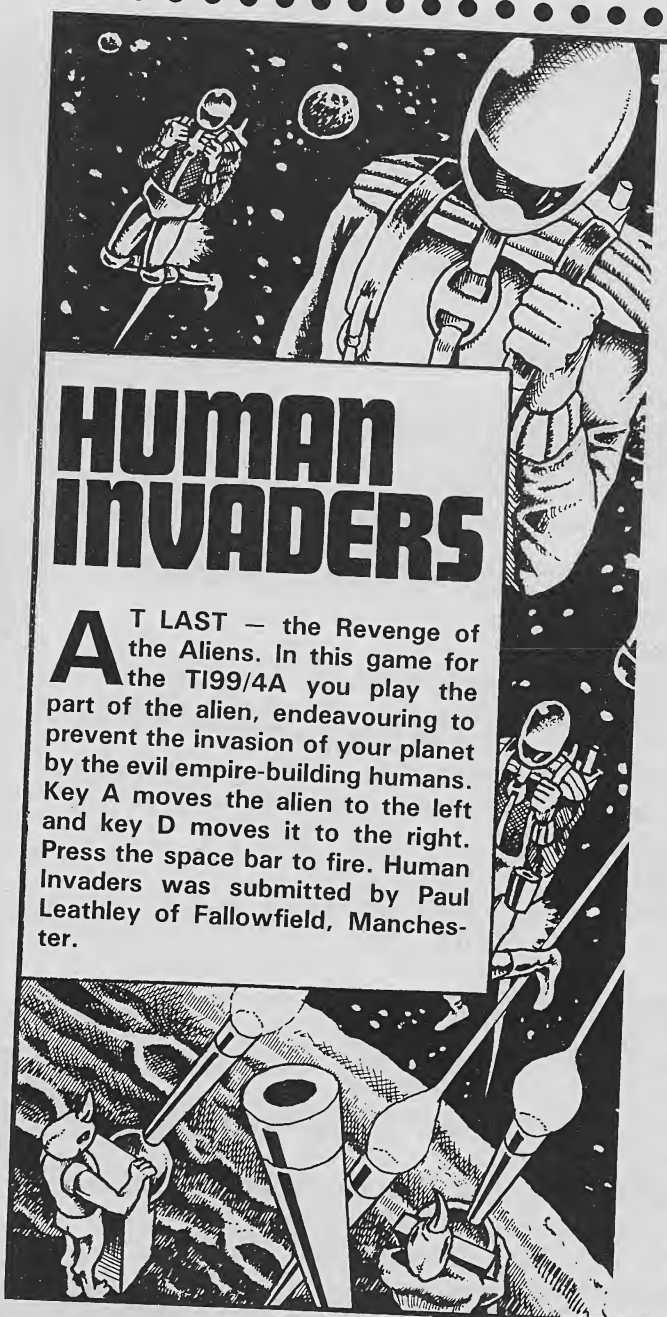
**Lifeboat was written for the Spectrum by Michael Kingsley of Bow, Devon. Letters to be entered in graphics mode are underlined, and inverse spaces are represented in lines 6030 and 6040 as (isp).**

```
  20 GO SUB 9000
  25 GO SUB 7000
  27 LET hi=500
  28 LET s=0: LET f=500: LET sc=
1: LET t=0
  35 LET l=3
  40 GO SUB 6000
  50 LET x=15: LET y=10: LET a$=
"E"
  51 LET w$="r"
  60 PRINT INK 6;AT y,x;a$: PAUS
E 5
  62 IF w$="n" THEN LET x=x-1: P
RINT INK 1;AT y,x+1;" "
  63 IF w$="m" THEN LET x=x+1: P
RINT INK 1;AT y,x-1;" "
  64 IF w$="a" THEN LET y=y-1: P
RINT INK 1;AT y+1,x;" "
  65 IF w$="z" THEN LET y=y+1: P
RINT INK 1;AT y-1,x;" "
  66 IF INKEY$="n" THEN LET x=x-
1: PRINT INK 1;AT y,x+1;" ": LET
 w$="n": LET a$="E"
  67 IF INKEY$="m" THEN LET x=x+
1: PRINT INK 1;AT y,x-1;" ": LET
 w$="m": LET a$="E"
  68 IF INKEY$="a" THEN LET y=y-
1: PRINT INK 1;AT y+1,x;" ": LET
 w$="a": LET a$="F"
  69 IF INKEY$="z" THEN LET y=y+
1: PRINT INK 1;AT y-1,x;" ": LET
 w$="z": LET a$="F"
  105 IF x<2 THEN LET x=2
  106 IF x>29 THEN LET x=29
  107 IF y<5 THEN LET y=5
  108 IF y>19 THEN LET y=19
  110 IF ATTR (y,x)=11 THEN GO SU
B 3000
  120 IF ATTR (y,x)=10 THEN GO SU
B 3100
  130 IF ATTR (y,x)=8 THEN GO TO
3200
  140 IF ATTR (y,x)=12 THEN GO TO
 3200
  150 PRINT INK 7;AT 1,7;s;AT 1,2
0;hi;AT 1,15;f
  160 LET f=f-1: IF f=101 THEN GO
 SUB 3200
  170 IF t=(9+sc) THEN GO TO 5000
  180 GO TO 60
3000 BEEP .1,9: LET s=s+1: LET t
=t+1: RETURN
3100 BEEP .1,6: LET f=f+100: LET
 t=t+1: IF f>900 THEN LET f=900
3110 RETURN
3200 FOR x=10 TO 0 STEP -1: BEEP
 .15,x: NEXT x: LET f=500: LET l
=l-1
3201 IF l=0 THEN GO SUB 4000
3210 IF l=0 THEN GO TO 28
3220 GO TO 50
4000 REM ££GAME OVER££
4001 CLS : PRINT INK 0;AT 12,11;
 FLASH 1;"GAME OVER"; FLASH 0: P
RINT INK 7;AT 19,6;"Press any ke
y to play": PAUSE 0: IF s>hi THE
N LET hi=s
4010 CLS : RETURN
5000 CLS : LET p=40+(sc*10): LET
 s=s+p: PRINT INK 4;AT 5,11;"BON
US ";p; INK 6;AT 10,7;"SCREEN ";
sc;" COMPLETED": LET sc=sc+1: FO
R x=1 TO 20 STEP 2: BEEP .15,x:
NEXT x: PAUSE 150: LET t=0: GO T
O 40
6000 REM ££SET UP SCREEN££
6001 BORDER 5: PAPER 1: CLS
6010 FOR x=0 TO 31: PRINT INK 7;
AT 2,x;"_": NEXT x
```

*continued overleaf*

*continued from previous page*

```
6020 PRINT AT 1,1; INK 7;"SCORE"
;AT 1,22;"HIGH";AT 1,12; INK 2;"
B"
6030 FOR x=1 TO 30: PRINT INK 1;
AT 4,x;"(isP)";AT 20,x;"(isP)":
NEXT x
6040 FOR x=4 TO 20: PRINT INK 1;
AT x,1;"(isP)";AT x,30;"(isP)":
NEXT x
6045 FOR z=1 TO 4
6046 LET m=5+3*sc
6050 FOR y=1 TO m
6060 LET a=(RND*30)-1: IF a<3 TH
EN GO TO 6060
6070 LET b=INT (RND*15)+4: IF b=
4 THEN GO TO 6070
6075 IF z=1 THEN LET q=3
6076 IF z=2 THEN LET q=2
6077 IF z=3 THEN LET q=0
6078 IF z=4 THEN LET q=4
6080 PRINT AT b,a; INK q;CHR$ (z
+149): BEEP .05,8
6090 NEXT y
6095 NEXT z
6100 RETURN
7000 REM ££INTRODUCTION££
7001 BORDER 5: PAPER 0: CLS : IN
K 5: PLOT 80,81: DRAW -40,31: DR
AW 8,40,-PI/2: DRAW 96,-72
7002 INK 2: PLOT 112,104: DRAW 1
6,16: DRAW 60,-40: PLOT 165,96:
DRAW 40,16: DRAW 8,-16: DRAW -8,
-16: INK 1: PLOT 0,80: DRAW 255,
0
7003 PRINT INK 7;AT 0,11;"LIFE B
OAT"; INK 6;AT 1,6;"By Michael K
ingsley"
7010 PRINT INK 2; FLASH 1;AT 13,
```



# HUMAN INVADERS

AT LAST — the Revenge of the Aliens. In this game for the TI99/4A you play the part of the alien, endeavouring to prevent the invasion of your planet by the evil empire-building humans. Key A moves the alien to the left and key D moves it to the right. Press the space bar to fire. Human Invaders was submitted by Paul Leathley of Fallowfield, Manchester.

```
100 CALL CLEAR
110 PRINT "          ********************"
120 PRINT "          * HUMAN INVADER  *"
130 PRINT "          ********************"
140 FOR K=1 TO 9
150 PRINT
160 NEXT K
180 FOR D=1 TO 750
190 NEXT D
200 HI=0
210 V=0
220 CALL CLEAR
230 SC=0
240 X=10
250 CALL CHAR(128,"18187EBDBD242466")
260 CALL COLOR(13,11,2)
270 CALL CHAR(145,"000818C1C1C2A2A22")
280 CALL COLOR(15,6,2)
290 CALL CHAR(137,"22954AA55AB55A24")
300 CALL COLOR(14,9,2)
310 FOR G=1 TO 12
320 CALL COLOR(6,16,2)
330 NEXT G
340 CALL SCREEN(2)
350 FOR G=1 TO 35
360 RANDOMIZE
370 A=INT(RND*20)+1
380 B=INT(RND*32)+1
390 CALL HCHAR(A,B,46)
400 NEXT G
410 FOR I=1 TO 14 STEP 2
420 FOR J=6 TO 26 STEP 2
430 CALL HCHAR(I,J,128)
440 NEXT J
450 NEXT I
460 Z=55
470 GOTO 900
480 CALL HCHAR(22,X,145)
```

```
19;"S O S"; FLASH 0; INK 5;AT 15
,4;"Save the people,avoid the
  sharks and wreckage-Pick up
 First-aid boxes to stay alive."
7011 PRINT INK 4;AT 19,3;"Press
any key to continue"
7020 PAUSE 0
7030 PAPER 7: CLS : PRINT INK 1;
AT 3,7;".................You";A
T 5,7;"............Survivor";AT
 7,7;".......First-aid box";AT
9,7;"................Shark";AT 1
1,7;"............Wreckage"
7031 PRINT INK 6;AT 3,6;"F";AT 5
,6; INK 3;"A";AT 7,6; INK 2;"B";
AT 9,6; INK 0;"C";AT 11,6; INK 4
;"D"
7032 PRINT INK 0;AT 14,11;"Left.
..'N'";AT 15,11;"Right..'M'";AT
16,11;"Up.....'A'";AT 17,11;"Dow
n...'Z'"
7040 PRINT INK 1;AT 19,6;"Press
any key to start"
7050 PAUSE 0
7060 RETURN
9000 REM ££USER-GRAPHICS££
9001 FOR x=1 TO 6
9010 FOR y=0 TO 7
9020 READ a: POKE USR CHR$ (64+x
)+y,a: NEXT y
9040 NEXT x
9050 DATA 56,56,186,146,186,124,
56,254,0,0,124,108,68,108,124,0,
7,14,30,60,60,124,254,255,0,64,6
4,96,48,24,8,12,0,126,195,129,12
9,195,126,0,60,102,66,66,66,66,1
02,60
9060 RETURN
```

```
490 CALL KEY(0,K,S)
500 IF K<>65 THEN 550
510 X=X-1
520 IF X<2 THEN 610
530 CALL HCHAR(22,X+1,32)
540 GOTO 480
550 IF K<>68 THEN 600
560 X=X+1
570 IF X>30 THEN 630
580 CALL HCHAR(22,X-1,32)
590 GOTO 480
600 IF K=32 THEN 650 ELSE 480
610 X=2
620 GOTO 480
630 X=30
640 GOTO 480
650 CALL SOUND(300,-5,5)
660 F=20
670 P=INT(RND*5)+11
680 CALL HCHAR(F,X,42)
690 IF F<=2 THEN 880
700 F=F-2
710 CALL HCHAR(F+2,X,32)
720 CALL GCHAR(F,X,Y)
730 IF Y=128 THEN 750
740 GOTO 680
750 CALL HCHAR(F,X,137)
760 CALL SOUND(150,523,5)
770 FOR D=1 TO 15
780 NEXT D
790 CALL HCHAR(F,X,32)
800 SC=SC+1
810 Z=Z-1
820 IF Z=0 THEN 410
830 M$=STR$(SC)
840 FOR I=1 TO LEN(M$)
850 CALL HCHAR(3,I+15,
    ASC(SEG$(M$,I,1)))
860 NEXT I
870 GOTO 470
880 CALL HCHAR(F,X,32)
890 GOTO 470
900 B=16
910 A=INT(RND*21)+6
920 CALL HCHAR(B,A,33)
930 B=B+2
940 CALL HCHAR(B-2,A,32)
950 IF B=22 THEN 970
960 GOTO 920
970 CALL GCHAR(22,A,C)
980 IF C=145 THEN 1010
990 CALL HCHAR(22,A,32)
1000 GOTO 490
1010 CALL SOUND(1000,-8,10)
1020 CALL SOUND(700,-5,0)
1030 CALL HCHAR(22,X,137)
1040 V=V+1
1050 IF V=3 THEN 1070
1060 GOTO 480
1070 CALL SOUND(2000,-5,0)
1080 M$="        @@@GAAME OVER@@@"
1090 FOR I=1 TO LEN(M$)
1100 CALL HCHAR(6,1,ASC(SEG$(M$,I,1)))
1110 NEXT I
1120 PRINT " YOU SCORED";SC;"POINTS"
1130 PRINT
1140 IF SC>HI THEN 1200
1150 PRINT " HI SCORE=";HI;"BY";B$
1160 PRINT
1170 PRINT " PRESS ANY KEY TO PLAY AGAIN"
1180 CALL KEY(0,K,S)
1190 IF S=0 THEN 1180 ELSE 210
1200 PRINT " YOU HAVE BEATEN THE HI SCORE"
1210 PRINT
1220 INPUT " YOUR INITIALS ?"-B$
1230 HI=SC
1240 GOTO 1160
```

**HI ! I'M BRAINY and I really rate computers. I'm in *Load Runner* every issue so write to me at 196-200 Balls Pond Road, London N1 4AQ and I'll do my best to answer any questions you have.**

**Remember, Brainy's the name and, by the way, I will pay £1 to anyone whose name is mentioned. Write away!**

# BRAINY'S BRAINBOX

## Battle of the sexes

**IN THE STORY School for Software in printout No 7, there were boys being jealous about a girl who was interested in computers. That is what happens at my school. What can we girls do to prove we are as good as boys with computers?**

*Jennifer Lane, Bristol.*

THE ONLY SOLUTION of which I can think is to try to ignore the fact. If you are sufficiently interested, you will find that once you and a friend have started and have been seen more often in the computer room, it will not matter.

If you are consistent enough and show that teasing does not concern you, you will relax more and be able to show you are just as capable as the boys. Remember that the author of the best machine code programming book for the ZX-81 was a woman and many good programs are designed by females.

* * *

## BBC CHAIN of command

**MY FRIEND has a BBC computer. She says that to get a program to RUN after LOADing, you type CHAIN"". That does not work on my Spectrum. Why not?**

*Graham Bradley, Plymouth.*

THE TROUBLE is that the Spectrum has a different Basic programming language from the BBC micro. With most SAVEd games as soon as it has been LOADed it runs. The BBC CHAIN makes the program run from the first line when it is loaded. So with the Spectrum the programmer decides if it should run automatically, while with the BBC it is the user who decides.

* * *

## Discovering Spectrum quirks

**WHILE PASSING the time with my Spectrum I found that if I RUN: '10 PRINT "Eric" 20 GOTO 10,' the computer scrolls my name, but if I press caps shift and symbol shift, the message RUN E appears. Then if I press ENTER a number of words fill the screen and after two scrollings I get the statement: K Invalid colour, 10:1. Could you tell me what it means?**

*Eric Llewellyn, Newport.*

THIS IS an interesting 'quirk' in the Spectrum ROM. The E stands for extended mode which enables you to get at the green and red commands round the keys. It also lets you colour words and sentences separately. That is probably why the message 'Invalid colour' is printed. I cannot understand why it prints RUN E. If you are deeply interested in these 'quirks' of the Spectrum ROM, refer to Ian Logan's book *Understanding your Spectrum.*

* * *

## Starring in motion pictures

**HOW CAN I make graphics pictures I have programmed into my computer move around the screen without using a number of PRINT AT statements?**

*John Denning, London N7.*

IT SOUNDS as if you have a Sinclair micro but the answer applies to most machines, though some use @ or TAB instead of AT. The best way of which I know is instead of using numbers after the AT, use variables for the horizontal or vertical — or both — positions, depending on which direction you want your picture moving. If you want it to move left or right, change the horizontal variable value in a loop.

If you want it to move up or down, use the loop to change the vertical one. If you want it to move diagonally, change both. These lines will move * left:

```
FOR h=20 TO 10 STEP -1
PRINT AT 10, h; *_"
NEXT h
```

These move it up:

```
FOR v=20 TO 10 STEP -1
PRINT AT v, 10; "*"; AT v+1, 10;
" "
NEXT v
```

These move it down and to the right:

```
FOR p=10 TO 20
PRINT AT p, p; "_*"; AT p-1, p;
" "
NEXT p
```

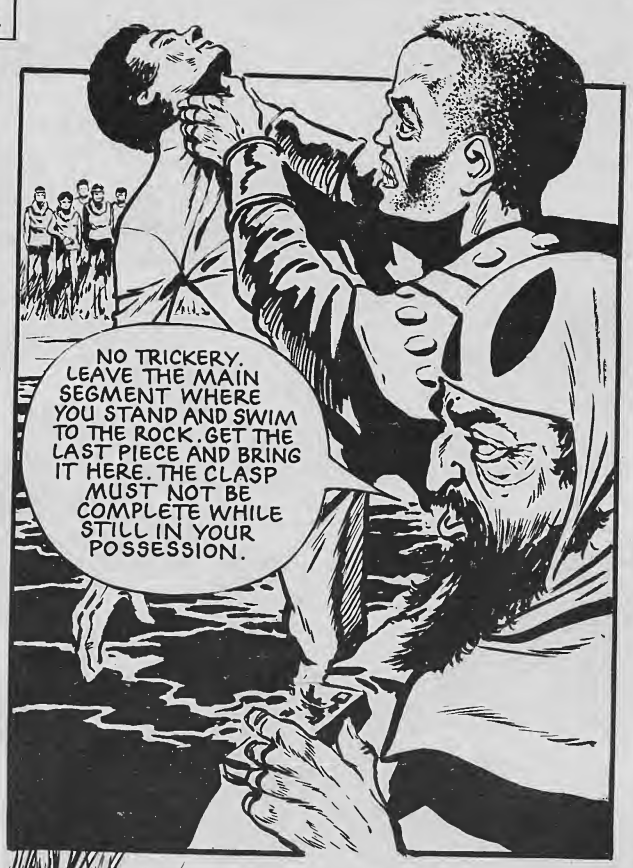
All those spaces I have marked with _ are to wipe the star from its last position. That should be enough to get you STARted.

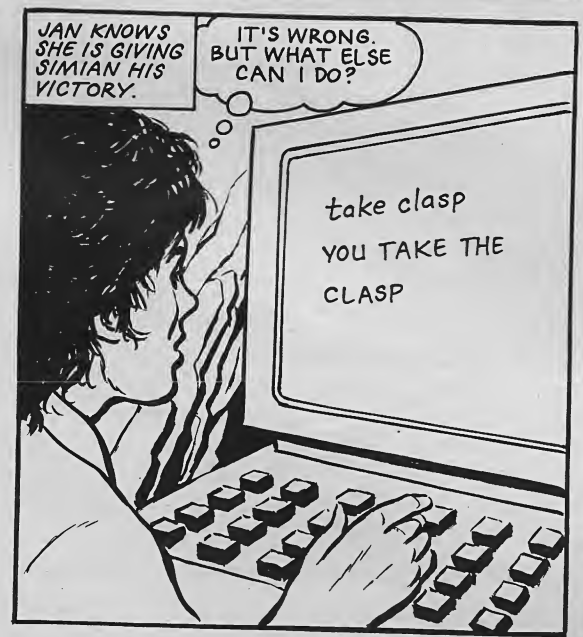
* * *

SEE BRAINY BLUSH. Things move fast in this world. Since I said you could not make an Apple sing and implied that was true for all micros, I have seen an American magazine featuring Voice Box II for the Atari 48K disc machine. It is a speech and singing synthesiser, with a face on-screen with synchronised lips. It costs $169.

# TRUMBULL'S WORLD

IN THE LAST STAGE OF JAN AND MARC'S QUEST THROUGH THE COMPUTER ADVENTURE WORLD CREATED BY THEIR FATHER, MARC HAS BEEN CAPTURED. EVENTS DRAW SWIFTLY TO A CLOSE.





BUT OUTSIDE THE GAME THERE IS CELEBRATION.
PROGRAMMER TRUMBULL IS FINALLY RELEASED.
GATE 5
FREE TRUMBULL
BUT IMPRISONMENT HAS TAKEN ITS TOLL.
THEN, IN THE MAIN CONTROL ROOM.
BUT CAN YOU GET THEM BACK?
I CONCEALED THE EQUATION IN A CLASP, AND HID IT IN AN ADVENTURE WORLD. MY CHILDREN WENT INTO THE GAME TO SEARCH FOR IT.
I THINK SO, AND RETRIEVE THE EQUATION.
AND IT WILL BE OVER. WE WILL BE FREE? FREE TO EXPLORE NEW GALAXIES?
IF THEY'VE FOUND PARTS OF THE CLASP AND NOT OTHERS, THERE WILL BE PROBLEMS.
YES, WITH THE EQUATION THE POSSIBILITIES ARE INFINITE! NOW I MUST HAVE TIME TO WORK.
PROBLEMS TRUMBULL CAN'T EVEN IMAGINE...
QUICKLY. GIVE IT TO ME!
AS SIMIAN TAKES THE CLASP SEGMENT...
NNOO!!
PRAY GOD I'M IN TIME!

IF NOT FOR THE GAME HELP, I'D NEVER MAKE THIS.

JAN RETRIEVES THE REST OF THE CLASP AND...
WAKE UP, MARC. THEY'RE COMING. SOMEONE HELP ME PLEASE.

OUTSIDE THE GAME, TRUMBULL'S WORK IS ALMOST COMPLETE.
A FEW MINOR ADJUSTMENTS AND I CAN GET THEM BACK. READY?
READY.

run retrieve
RUNNING...

OR IS IT ALREADY TOO LATE?
AT LAST... MY REWARD!

TWO LIVES SPARED...

...AND ONE LOST.
FOLLOW THEM!
WE CAN'T. THE BLOW FROM THE SPEAR DAMAGED IMPORTANT CIRCUITS. WE'RE TRAPPED!

YOU ARE SAFE. THANK GOD.
JAN EXPLAINS THE DANGER...
SO THE FINAL PIECE IS STILL IN THERE. AND SIMIAN'S GOT IT.
IF THAT'S TRUE, THEN I CAN'T RETRIEVE THE EQUATION.
WE'VE WON AND LOST. HE'S BEEN OVER-THROWN, BUT WE'RE STILL IN HIS POWER.

SIMIAN AND THE HUNTER EXULT WITH UNHOLY JOY!
THEY WILL COME BACK. THEY HAVE TO. AND THEN THEY WILL FACE ME.
Coming soon: THE SAVAGE, SINISTER,
SIMIAN'S WORLD

# More WINNING GAMES from LYVERSOFT

**LUNAR RESCUE (48K SPECTRUM)**
A team of research scientists are trapped on the moon and you have to pilot the rescue pod from the mother ship and ferry them back safely. But you have only space for one scientist at a time. 100% M/C action with super smooth HI-RES GRAPHICS AND JOYSTICK OPTION.

**LIBERATOR (16K/48K SPECTRUM)**
This game tests your aim and reactions as you command a gunsight on a homeward bound space freighter. Your cargo is the royal treasures of the empire and many people want them.
A machine code presentation that should have you hooked.

**THUNDERHAWK (48K SPECTRUM)**
Based on the popular arcade game Pheonix. This 100% full colour epic pitches you against the evil Albertrons who are set to destroy your race, five levels of fast action bring you to the command centre of battle fleet, can you finish the job. WITH JOYSTICK OPTION.

**GOLF (48K SPECTRUM)**
Using M/C graphic routines, a game to absorb the keen novice and the scratch player. Play on a 9 or 18 hole course, with full selection of clubs. Along the greens and fairways hours of addictive sport can be had.

**PICTURE PUZZLE (DRAGON 32)**
With HI RES graphics and 100% M/C. You are set the problem of putting the picture back together. Test your skill against the dragon 32 computer. A game guaranteed to hold you spell bound for hours.

**ANDROID INVADERS (DRAGON 32)**
In a change of tactics the beings beyond the stars have developed an android of human form to do their dirty work. And with the aid of sensor jamming they may prove formidable. Using full colour, M/C, hi-re graphics this game can offer up to 21 levels of combat.

**VOYAGER (VIC 20 8 OR 16K)**
The mission is simple, but its completion is far from being so. As captain of starship you have all the best facilities at your disposal. Unfortunately the klingons oppose you. A great M/C version of this classic computer game.

**SPHINX (VIC 20 8 OR 16K)**
A riveting, full colour graphic adventure. That pits you against the spells and guardians of the tomb. In your quest to uncover the treasure of the pharoahs. This game will have you enthralled.

**BIRD OF PREY (BASIC VIC 20)**
Evil baron von fritz is out to kill his cousin, the much loved Prince Rupert. The Baron intends to throw the prince from his plane into the sacred fire pit. But you the eagle of the north will make every endeavour to save your friend Prince Rupert. With colour, sound, this M/C game is a must.

**ALSO AVAILABLE:**

Demon Driver Basic VIC20 — £5.95
Lunar Rescue Basic VIC20 — £5.95
Space Assault 3 or 8 VIC20 — £5.95
Apple Bug/Crazy Climber Basic VIC 20 — £5.95
Nuclear Attack/Grand Prix Basic VIC20 — £5.95
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Hangman/Super Docker ZX81-16K £4.95
Bouncing Gorillas ZX81-16K—£4.95

**all games £5.95**

☐ VIC-20 Machine Code Monitor @ £14.95 each
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☐ Hearts & Diamonds/Hi-Lo (2 pack) @ £5.95 each
☐ Space Assault @ £5.95 each-For 3K & 8K VIC-20

} For any VIC-20

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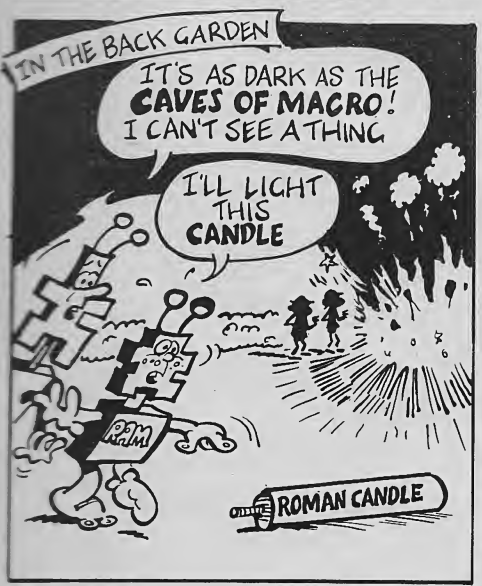
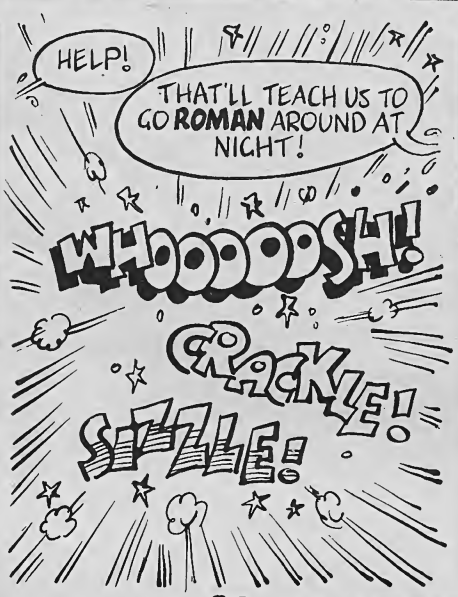
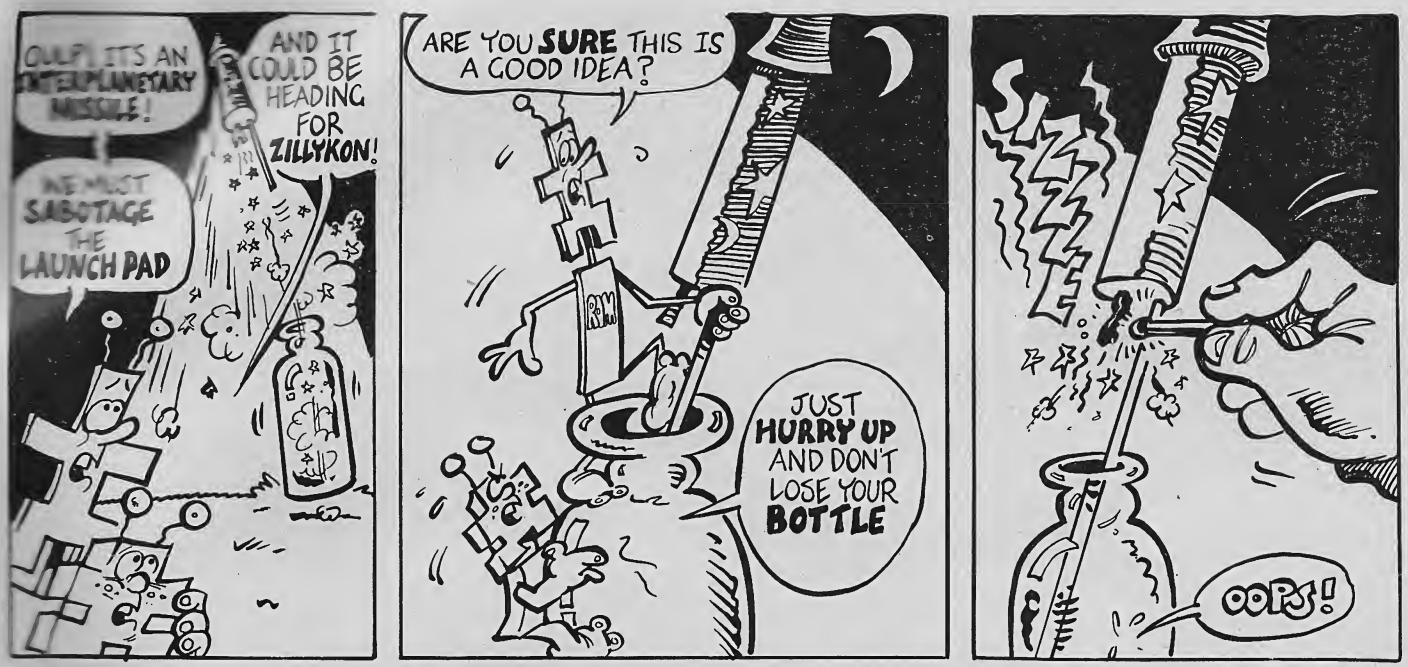
TVC1

# THE ADVENTURES OF ROM AND RAM





MORE FIREWORKS WITH ROM & RAM IN NEXT PRINTOUT!

MOVING FROM the usual Space War arcade game, Lunar Lander gave us the first simulated spaceship landing. Taken into the arcades by Atari, the game never became a huge success like its predecessors, Space Invaders, Galaxians and the rest, although plenty of skill was required in operating the spaceship.

The graphics are very similar to those of Asteroids with the details being white on a black background. The rocky terrain is a white outline running across the screen, with flat landing pads marked at various intervals; they are given values ranging from 2x to 5x.

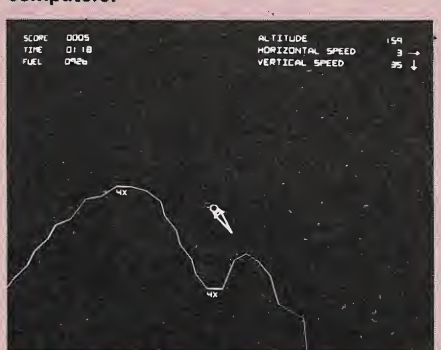
The player controls a small Lunar Module drifting high above the surface of a planet and, using an aircraft-type throttle and two rotate buttons, the player has to manoeuvre the craft on to one of the landing pads. That is not as easy as it may sound but the player is helped in his descent. As the module nears the landing pad the screen switches to a close-up of the touchdown.

If things begin to look difficult and a crash seems imminent, there is an abort button for you to use at the last moment and it will thrust you back into space for a second run. There are various gauges at the top of the screen informing you of altitude, speed and fuel but the only one you need to keep an eye on is the fuel. There are several skill levels, so if you think you are a budding Neil Armstrong, practise and set your level high.

## Software

THERE ARE very few Lunar Lander computer games. Adventure International produces a Lunar Lander for a 24K Atari and also one for the Tandy TRS-80.

Games based on Lunar Lander are available for one or two of the more popular computers.

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